

Relationships between Lifestyle Factors and Self-reported General Health

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Abstract

Background: *Current health problems are complex and often related to a person's lifestyle, and thus it is necessary to examine them with self-reported data. These kinds of data can be an important complement to more objective data based on the assessment made by health professionals, as reported by Idler and Benyamini (Idler and Benyamini 1997). In this study, we examined the relationships of Lifestyle factors and risk factors with self-reported general health in an adult Norwegian population.*

Objective: *The objective of this study was to examine the relationships between Lifestyle factors and risk factors with self-reported general health and whether these relations are mediated by illness and socio-demographic characteristics in the adult Norwegian population.*

Methods: *This study was a quantitative, cross-sectional design using anonymous data from the 1997-1999 (HUSK) health study. The study population included individuals in Hordaland county, born 1953-57 (29,400). A total of 18581, among these 8598 men and 9,983 women participated. The Completed information for all variables included in the current study was available for 12,883 individuals (44%) of the study population. The data analyses were performed using univariate and multivariate logistic regression analyses.*

Findings: *Among the total of 12,883 male and female individuals, 11,208 (87%) reported very good and 1675 (13%) poor health status. Being women gender (OR: 1.3), unmarried or not living with a partner, (OR: 1.5), and with illness (OR: 2.7, increased the likelihood of reporting poor health status compared to men and married individuals. In addition, Overweight or Obesity, high alcohol/spirits/ consumption and current smokers had (OR: 1.6 or 1.7, 3.3 and 1.2) increased risk of reporting poor health status, respectively. On the other hand, being physical active, attaining high school or college/university education and moderate alcohol/wine/ consumption had (50%, 30% or 40%, and 30%) reduced likelihood of reporting poor self-reported health status, respectively.*

Conclusion: *Self-reported general health was positively associated with lifestyle factors such as, Leisure time exercise, individuals who consume moderate amount of alcohol/wine/ and attained better educational background and being gender men. On the other hand, Health-related behaviors and risk factors, such as being overweight or obese, consuming high alcohol /spirits/, and being current smokers and not in living with a partner, women gender,*

health problems and low educational status were found determinant factors to predict poor self-reported health in middle aged Norwegian populations. Therefore, to reduce the risk of reporting poor self-reported health in the Norwegian society, Future health policy, intervention strategies should consider and target health-related behaviors such as, high alcohol intake, chronic diseases, gender women, and physical active and cigarette smoking. In summary, a one-item question measuring self-reported health may be a suitable measure for health care providers or nurses to use in a practical setting, to identify levels of subjective health among the patients and clients of their health care services users.

Publication: *This study was a part of a Master thesis and has been performed from June 2012- 2013 and an article will be published in an international peer-reviewed journal and the thesis was submitted in the autumn semester 2013.*

Keywords: *Self-reported health, Health Behaviors, Lifestyle factors, Risk factors, Socio-demographic factors, Health status, leisure time exercise, body mass index, recommended weight, alcohol/spirits/ consumptions, health-related behaviors, Quality of life. Illness (chronic health problems).*

1. INTRODUCTION

1.1 Background

Current health problems are complex and often related to a person's lifestyle, and thus it is necessary to examine them with self-reported data. These kinds of data can be an important complement to more objective data based on the assessment made by health professionals, as reported by Idler and Benyamini (Idler and Benyamini 1997) in a review of 27 community studies. This review found that self-reported health was a predictor of mortality in nearly all of the studies and this connection may be seen as well established (Idler and Benyamini 1997). The question of how people may understand and interpret the concept of self-reported health is still unanswered. Jylha (Jylha 2009) has proposed a conceptual model to help identifying the different types of information on which people base their health assessments. In this model, the evaluation of one's own health encompasses a review of information, such as functional status, diseases, health behaviors and socio-demographic factors. Additionally the model consists of factors comprising contextual frameworks, such as cultural aspects (Jylha 2009).

Lifestyle factors are among the kind of behaviors that individuals consider when they report their own general health (Jylha 2009), and previous research have found that cigarette smoking and alcohol consumption were related to reduced physical and mental health (Riise, Moen et al. 2003). In addition, obesity has been found as a predictor of self-rated health (Prosper, Moczulski et al. 2009). The experience of general health have also been found to differ according to levels of education (Thrane 2006) (Faresjo and Rahmqvist 2010) and age (McFadden, Luben et al. 2008). One previous study have examined if different risk factors contributed to self-reported health, where the effect of various health problems also was included (Manderbacka, Lundberg et al. 1999). In this study, the authors examined the relationship between risk factors such as dietary habits, exercise, smoking, alcohol consumption and body mass index, and self-reported health. They found that these associations were weakened or not significant at all when they were adjusted for health problems, (Manderbacka, Lundberg et al. 1999).

In this study we examine the associations between lifestyle factors (smoking, alcohol consumption, leisure time exercise and body mass index), and self-reported general health in

an adult Norwegian population, with adjustment for socio-demographic characteristics (age, gender, marital status and education) and diseases (heart disease, apoplexy and diabetes).

1.2 Conceptual Framework

Since 1948 (WHO established), the world health organization's definition of "health" is being not merely absence of infirmity and disease, but also the experience of mental, physical and social well-being. General self-reported health may be seen as the perception of an unhealthy lifestyle and an evaluation of one's own future health status (Idler and Benyamini 1997). Lifestyle factors, such as physical activity, alcohol consumption, cigarette smoking, dietary intake habits, are a bundle of behaviors that describe the way an individual lives his or her life. Such behaviors may contribute to the development of chronic health problems and may reduce life expectancies and quality of life. The factors that people evaluate when rating their own health have been studied comprehensively. A European Health report revealed that lifestyle factors such as tobacco use, alcohol consumption, and high cholesterol, being overweight, physical inactivity, low fruit and vegetable intake, are responsible for the major burden of health problems in Europe (WHO 2005).

1.3 Literature Review

Today's health problems are complex and often related to a person's lifestyle and health behaviors, and it is crucial to evaluate them with subjective information. Such kinds of data can be an important complement to more objective data based on the assessment made by health professionals, and sometimes also be an even more accurate data source,(Idler and Benyamini 1997). Self-reported general health can reveal the presence of subtle physiological as well as biological differences that may lead an individual to evaluate one's own health more accurately than the observations made by clinicians (Riise, 2012).

In a review of the literature, we have found only one study examining if risk factors and health behaviors contribute to self-reported health (Manderbacka et al 1999). In this study, the authors studied the relationship between risk factors such as dietary habits, exercise, smoking, alcohol consumption and body mass index, and self-reported health in a Swedish population aged 18-75 years. They found that all these factors, except dietary fat, were associated with self-reported health. Furthermore, the effect was mediated by health problems, but some of these factors (smoking, not consuming vegetables, as well as obesity and underweight among the young respondents) had an independent association with self-reported health, (Manderbacka et al 1999). Other studies have found that obesity was seen as

a predictor of self-rated health (Prosper et al 2009) and lifestyle factors was associated with health-related quality of life (Riise et al 2003).

2. Overall Objective

2.1 Specific objectives

2.1.1 To examine if Lifestyle factors and risk factors predict self-reported general health status in an adult Norwegian population and

2.1.2 To assess whether these association are mediated by socio-demographic factors and chronic diseases (heart disease, apoplexy and diabetes)

3. Methods and Materials

3.1 Sample and selection criteria

This study was a quantitative, cross-sectional design based on anonymous data from the 1997-1999 (HUSK) study. The data was collected 1997-1999 in Hordaland Country, Norway, as a collaboration between the National Health Screening Service, the University of Bergen and local health services. The study population included all individuals who were born 1953-57 (29,400) and have resided in Hordaland county. A total of 8,598 men and 9,983 women participated, yielding a participation rate of 52 % for men and 70 % for women. The Complete information for all variables included in the current study was available for 12,883 individuals (44 % of the study population).

The study protocol was approved by the Regional Ethics Committee and by the Norwegian Data Inspectorate.

3.2 Measurements

Information on self-rated health, socio-demographic variables, disease, and lifestyle factors were obtained from self-administered questionnaires. The Self-rated health as outcome variable, was measured by using one single-item question: “How is your overall health status at the moment?”, with four response categories: “bad”, “poor”/“not so good”/, “good” and “very good”, these were dichotomized into “very good/good” and “not so good/poor” in the analysis. This measure have previously been validated and shown a good reliability, (Lundberg and Manderbacka 1996).

The socio-demographic factors and confounding factors were being studied; gender, civil status, and education and illness based on self-administered questionnaires from the 1997-1999 study (HUSK) data. Gender, (men vs. women), Marital status was categorized with five responses but, in analysis dichotomized into “married” vs unmarried or others (including living with a partner). Education was used as an indicator of socioeconomic status. It was assessed as study participants total years of education and categorized as “low” (up to and including 10 years of schooling), “medium” high school and “high” (college/university) levels of education. Chronic diseases, were coded as with Illness vs no illness with the self-reported occurrence of heart attack, apoplexia and diabetes.

The measures of health-related behaviours and lifestyle factors were leisure time exercise, tobacco /use/ smoking, BMI, and alcohol consumption. Physical activity was assessed by using dichotomized questionnaires into light (not sweating or short of breath) and hard (with sweating and short breathing). The leisure time exercise for last year was coded as an average number of exercise hours per week. The coding categories were “none”, “less than 1 hour”, “1-2 hours”, and “3 hours or more” for both light and hard forms of exercise. These questions have demonstrated minimum to moderate correlations with a $\dot{V}O_2$ max measurement through an exercise test on a treadmill (Kurtze, Rangul et al. 2007). Data on tobacco/use/ smoking were coded into three categories; “never smokers”, “former smokers”, and “current smokers”. The questions used for assessing smoking habits has shown predictive validity for the risk of coronary heart disease morbidity (Igland, Vollset et al. 2012). Units of alcohol per two weeks were categorized as “none”, “1-14”, and “15 or more” units for beer, wine, and spirits units, respectively. 15 units/two weeks have previously been used as a cut-off point for high alcohol consumption (Myrtveit, Adriansen et al. 2013). The questions used for assessing alcohol consumption in this study have shown predictive validity for the risk of non-response in a population-based health study, (Torvik, Rognmo et al. 2012).

Height and weight were measured at a physical examination, and BMI was calculated as kilograms per square meter and divided in accordance with the World Health Organization classification of underweight (<18.5), normal/recommended/ weight (18.5-24.9), overweight (25-29.9), obesity grade I (30-34.9) and obesity grade II and more than (35+ kg/m²) (WHO 2000). Behavioral changes, age, income status and Tea/Coffee consumption were omitted in analysis.

3.3 Data analysis

Descriptive statistics used counts, proportions and percents to describe lifestyle and socio-demographic variables. Univariate and multivariate logistic regression were applied to examine the associations between lifestyle factors (consumption of beer, wine and spirits, BMI, light and strenuous physical activity and smoking) as predictor variables with self-rated health as outcome variable. The Gender, Age, Marital status, Education, and diseases were included as covariates, and preliminary analysis showed that it did not influence the results (data not shown). A p-value <0.05 indicated statistical significance. The statistical package IBM SPSS for windows, version 20.0, was used in the analysis.

4. Finding

4.1 Statistical analysis

Women had 30% increased likelihood of reporting poor self-reported general health than men; (OR=1.3 (95% CI: 1.2, 1.5) $p<0.001$). The Participants who were unmarried/others had 50% increased risk of reporting of poor/not so good self-reported health as compared to married respondents; (OR=1.5 (95% CI: 1.4, 1.7) $p<0.001$). Those with higher or medium level of education had higher self-reported health. Respondents who had received medium and higher education had 30% and 40% decreased likelihood of reporting of poor/not so good self-reported health, respectively, as compared to the low level educated respondents, (OR=0.7 (95% CI: 0.6, 0.8) $p<0.001$ and (OR=0.6 (95% CI: 0.5, 0.7) $p<0.001$, respectively. Respondents who had at least one of the listed chronic diseases (Heart infarct, Apoplexies, and Diabetes) had more than 2folds increased risk of reporting poor/ not so good self-reported general health as compared to those who had no illness, (OR=2.7 (95% CI: 2.3, 3.1) $p<0.001$. Respondents who had Body mass index <18.5kg/m² /underweight/ and in addition, respondents who had 25-29.9kg/m² BMI did not show different levels of self-reported health compared to those who had normal BMI. (OR=1.2 (95% CI: 0.7, 2, 0) $p>0.05$. as compared to those who had recommended normal (18.5-24.9kg/m²) BMI participants, and (OR=1.1 (95% CI: 1, 0, 1.3) $p>0.05$, respectively. However, very high BMI measure was associated with increased probability of reporting poor self-rated health. Respondents who had 30-34.9kg/m² BMI had 60% increased likelihood of reporting poor self-reported health compared to recommended 18.5-24.9kg/m² /normal/ body mass index respondents, (OR=1.6 (95% CI: 1.3, 1.9) <0.001 . The respondents who reported over

35kg/m² body mass index had 70% increased likelihood of reporting poor self-rated health compared to the body mass index 18.5-24.9kg/m² respondents, (OR=1.7 (95% CI: 1.3, 2.3) $P<0.001$.

The consumption of moderate amount of wine and beer was related to good self-reported health status. Participants who consumed 1-14 units of wine had 30% lower risk of reporting poor self-reported general health as compared to those who did not drink wine, (OR=0.7 (95% CI: 0.6, 0.8) $p<0.001$. However, Participants who were drinking 15 and above units of wine did not report any difference in self-reported general health level as compared to none consumed respondents, (OR=0.8, (95% CI: 0.4, 1.4) $p>0.05$. Participants who consume 1-14 units of beer per two weeks had 20% reduced likelihood of reporting poor/not so good self-reported general health compared to those who did not consume beer, (OR=0.8, (95% CI: 0.7, 0.9) $p<0.001$. Nevertheless, respondents who consumed 15 and above units of beer did not show different self-reported general health, (OR=1.1 (95% CI: 0.8, 1.5) $p>0.05$.

The consumption of minimum amount and 11-14 units of alcohol/Spirit per two weeks did not report different self-rated general health, (OR=1.0 (95% CI: 0.9, 1.2) $p>0.05$. Nevertheless, the respondents who took 15 or more units of spirit per two weeks had 3 folds increased risk of reporting poor self-reported general health status as compared to none consumers, (OR=3.3 (95% CI: 1.4, 7.9) $p<0.001$. The respondents those who exercised light physical activity for less than an hour did not report variations on self-rated general health as compared to those who had not such activity, (OR=0.9 (95% CI:0.7, 1.2) $p>0.05$. However, the respondents who exercised light physical activity for 1-2 hour had 30% decreased likelihood of reporting poor self-rated general health as compared to those who not reported such exercise activity, (OR=0.7 (95% CI:0.6, 0.9) $p<0.008$. In addition, respondents who reported light physical activity for 3 or more hours had 30% lower risk of reporting not so good self-reported general health compared to those who did not exercise, (OR=0.7 (95% CI:0.6, 0.9) $p<0.05$. Respondents who reported hard physical activity for less than an hour per week had 20% declined likelihood of reporting not so good self-reported general health compared to those who had no such leisure time physical activity (OR=0.8 (95% CI:0.7, 0.9) $p<0.001$. Also, respondents who exercised hard physical activity for 1-2 hours per week had 30% decreased likelihood of reporting not so good general health as compared to those who did not exercise, (OR=0.7 (95% CI:0.6, 0.8) $p<0.001$. Moreover, participants who reported hard physical activity for 3 or more hours had 50% reduced likelihood of reporting poor self-

reported general health as compared to those who did not have such physical activity, (OR=0.5 (95% CI: 0.4, 0.7) $p<0.001$.

Being a previous smoker was not associated with self-rated health status, but being a current smoker was negatively related to self-reported general health, (See in Table-2). However, respondents who were former smoker had no differences of reporting poor self-reported general health as compared to the never smoker respondents, (OR=0.9 (95% CI: 0.8, 1.0) $p>0.05$. The respondents who were current smoker had 20% increased likelihood of reporting poor/not so good on their self-reported general health compared to the never smoker respondents, (OR=1.2 (95% CI: 1.1, 1.4) $p<0.001$. (See in Table-2).

4.2 Descriptive findings

In this study, participants (N:12,883) aged 40-44 years were included in the analysis. Among these, 6621(51.4%) were women and 6261(48.6%) were men. The majority, 9611(74.6%) of participants were married and 3272(25.4%) were unmarried or others. Education, 2190 (17%) of respondents completed low/basic/ school, 5900 (45.8%) respondents completed medium school, and 4793 (37.2%) participants completed college or university, (See in Table-1). The frequencies of the life style factors and risk factors were also shown in this table, and 6377(49.5%) % had body mass index of (18.5-24.9.kg/m²). A small proportion of study respondents, 1481 (11.5 %) had body mass index of 30 or more. The consumption of wine (1-14 units per two weeks) were 6351 (48.3%) of the participants, the consumption of beer (1-14 units per two weeks) were 5617 (43.6%) and the consumption of spirits (1-14 units per week) were reported by 2680 (20.8%) (See in Table-1). As shown (In Table-1), 5540 (43.0%) reported light physical activity and 1688 (13.1%) reported hard physical activity for or more hours per week. Furthermore, 4432 (34.4 %) of the participants were current smokers, and 3607 (28.0%) individuals were former smokers and 4844 (37.6%) of participants were none smoker,s (See In Table-1).

4.3 Lifestyle factors and self-rated health

As shown in Table-1, 11208 (87%) of the respondents reported very good health status and 1675 (13%) reported poor/ not so good health status, (See In Table-1). Among the lifestyle variables, Body mass was assessed by using a body mass index (BMI), weight in kilograms divided by square of height in the meters. The body mass index of 30 or more were significantly related to an increased risk of not so good or poor health (Table 2). Smoking

habit was categorized as never smoking, previous smokers and current smokers. Being a current smoker is also significantly related to an increased risk of not so good or poor health. In addition, the consumption of 15 or more units of alcohol/spirit/ per two weeks was significantly related to adverse health. On the other hand, a moderate intake of wine or beer (1-14 units per two weeks) reduced the risk of adverse health. Alcohol consumption was measured by coding 3 categories based on the number of units consumed alcohol per two weeks: none consumer, (0 alcohol consumption per two weeks), moderate drinking, (1-14 units per two weeks) and heavy drinking, 15 or more units of alcohol consumption per two weeks.

Leisure time exercise indexes were classified into Light and heavy leisure time exercises and measured based on numbers of exercised hours per a week. Furthermore, both light and hard physical activity decreased the risk of poor self-reported health. Self-reported health status variable was examined with one single-item question with four categorized responses such as, "bad", "poor"/"not so good"/, "good" and "very good" that were dichotomized into "very good/good" and "not so good/poor" in the analysis, (Table 2).

The associations between lifestyle factors, sociodemographic variables, and general health were similar whether the disease variable was included into the statistical model or not (results not shown). Hence, we did not find a mediating effect of the disease variable.

5. Discussion

The aim of this study was to examine whether there were associations between health-related behaviors and risk factors, illness and socio-demographic characteristics with the self-reported general health status in middle age Norwegian population.

In this study, we found that almost all the included health-related behaviors, risk factor, illness and socio-demographic variables were found statistically significantly associated with the self-perceived general health among the adult Norwegian population. In particular, high alcohol /spirits/intake, gender, marital status, illness, BMI and intensive leisure time exercise were highly associated with self-reported health. The associations between lifestyle factors, sociodemographic variables, and general health were similar whether the disease variable was included into the statistical model or not. Hence, we did not find a mediating effect of the disease variable.

The main study finding is in line with Riise and Colleaguse, (Riise, Moen et al. 2003), (Meyer and Tverdal 2005, Brekke, Hunskaar et al. 2006), (Frühbeck, Toplak et al. 2013) and (Manderbacka, Lundberg et al. 1999), as the study finding of Swedish, Manderbacka et al 1999), leisure time exercise, BMI, smoking and alcohol intake were associated with self-reported health. In addition, the study carried out by Brekke indicated, in the old (70-74) aged Norwegian population findings showed that those who attain less educational level and being gender women, were found negatively correlated with self-perceived health. As study had shown being overweight or obese, non-alcohol consumers and sedentary life was related with raised drug use/morbidity/. This probably reflects that Lifestyle factors of the Scandinavian or Swedish and Norwegian societies may share common lifestyle.

In current study, Leisure time exercise, better education attainments and moderate alcohol /Wine/ consumptions have shown positively significant relationships with the self-reported general health. On the other hand, being gender women, illness, single or others, high alcohol/spirits/ intake and overweight or obesity were found negatively related with self-perceived general health status. Among those, high alcohol/spirits/ consumption, illness, marital status, intensive leisure time exercise and overweight or obesity was found strongly statistically associated with poor self-reported health status. This is in line with the study conducted on middle aged Norwegian population, (RIISE.2003),(Brekke, Hunskaar et al. 2006), as Brekke puts, those who were physical inactive, being gender women and attained low education level had higher odds ratio (OR) related to poor quality of life. Other several previous studies, (Theobald, Johansson et al. 2003),(Lantz, House et al. 1998),(Manderbacka, Lundberg et al. 1999) had shown similar findings. The Leisure time exercise was associated independently with mortality, as reported by (Lantz, House et al. 1998). Furthermore, as one previous study conducted in Sweden showed, (Johansson and Sundquist 1999), obesity was found associated only in women. This probably reflects that women have more sedentary life, less educational attainment than men and may also relate to type of occupations.as Study finding of, (Riise, Moen et al. 2003), farmers and fishery workers scored least on the mental components of health status, whereas the drivers scored lowest on similar components. As Riise and Colleaguse, (Riise, Moen et al. 2003), indicated that high alcohol consumption was strongly related to the poor quality of life. According to one meta-analysis study carried out in USA, indicated that who were with illness was associated with the increased risk of mortality and poor self-reported health status, (DeSalvo, Bloser et al. 2006). In our study, We found that the consumption of 15 or more units of spirits per two weeks increased the risk of

poor self-reported health, and this result is in accordance with previous research on binge drinking (Tsai, Ford et al. 2010). On the other hand, those who consumed moderate amount of wine had better self-rated health as compared to those who consumed higher amount of wine. This may be related with certain reasons/explanations: First, small amount of wine consumption might give joy and happiness in life, and second; it could be related to the confounding factors that people already had good health by enjoying moderate amount of wine. The similar finding were revealed from previous studies, (Riise, Moen et al. 2003),(Poikolainen and Vartiainen 1999), (Poikotainen, Vartiainen et al. 1996), (Manderbacka, Lundberg et al. 1999),(Theobald, Johansson et al. 2003), As (Djousse, Driver et al. 2011), The moderate alcohol consumption had revealed that it was related to a lower natural life span risk of diabetic mellitus. However, the finding contradicts with the finding of a fifteen years follow up study in Finland, (Koivumaa-Honkanen, Kaprio et al. 2012). As Riise, 2003, indicated, the alcohol consumption was strongly associated with Mental Component Scores and Physical Component Scores. The study showed, that those who reported a moderate alcohol consumption of at least once a month, scored higher on both Mental Component Scores and Physical Component of good quality of health status than non-consumer. One Swedish study showed, (Theobald, Johansson et al. 2003), that wine as well as beer beverages were the most frequent kind of alcohol consumed as compared to other kind of beverage intake per week. (Theobald, Johansson et al. 2003). As Riise and Colleagues, (Riise, Moen et al. 2003), mentioned, the relations between moderate amount alcohol/Wine/ consumption and self-reported health may be less clear.

As the studies by (Dupuy, Godeau et al. 2011) and (Manderbacka, Lundberg et al. 1999) showed, being underweight among young aged (18-34) respondents were found significantly related with self-reported health. In addition, as the study conducted in united states by (Ferraro and Yu 1995) revealed, that individuals who have better annual household income and higher educational background as well as younger respondents had better self-rating health as compared to their counterparts. This age difference may reflect that probably, health is more concerned in the younger age than middle and older age.

In current study, being women showing worse self-reported health than men, which is in line with the (Riise, Moen et al. 2003),(Johansson and Sundquist 1999, Breidablik, Meland et al. 2009), and Swedish study, (Manderbacka, Lundberg et al. 1999), (Johansson and Sundquist 1999). As the study revealed that women scores lower than men in both Physical Component Scores and Mental Component of quality of life scores. Furthermore, being women, single or

others, and with less educational status, probably contributes most likely to higher risk of reporting poorer self-reported health than did others (RIISE;2003). In addition, as Swedish study indicated, that if women did not take fresh vegetable in their diet, they were more likely to report poorer self-reported health than men.(Manderbacka, Lundberg et al. 1999). And the study carried out in England indicated that lifestyle factors such as being non-moderate alcohol consuming, smoking, educational attainment, and social class were significantly related to quality of diet, (Harrington, Fitzgerald et al. 2011). This may be due to consequences of low educational background, less physical activity, less social attachment affairs and low socio-economics /income/ factors as compared to men.

According to our study findings, those who had college/university education (Table-2) were more likely to have better self-reported health. Being physical active was found to be a protective factor for poor self-reported health as compared to less physical activity, and similar patterns of association have also been reported in earlier studies. These studies reflected that a minimum level of education was related with poor self-reported general health, in drug utilization, in a self-reported study among old age Norwegian population,(Brekke, Hunskaar et al. 2006), (Ferraro and Yu 1995, Lantz, House et al. 1998). As these studies showed, those with less educational background had lower annual household income and were more likely to be overweight, being in the least quintile for Leisure time exercise, and current smoker. This probably reflects the lack of awareness about the consequences of risk behaviors and is related to the occupational status and low socio-economics status. However, relationships between lower income and overweight are yet unclear. Furthermore, those with less educational attainment were most likelihood to die than individuals with 16 years of education or more. According to Riise and colleagues, (Riise, 2003), smoking was significantly associated with the Physical Component Scores and Mental Component Scores and the study showed that the risk of reporting poor quality of life as well as self-reported health status was clearly associated with cigarette-dose. As indicated in the study, those who smoked 10 and more cigarettes per day had highest risk of poor self-reported health status as compared to counterparts.

The association between income and mortality, education and mortality were stronger in women than men. According to the study, the annual household income was more predictive of mortality than education while education was highly associated with health behaviors, as stated in the study findings,(Jonsson, Hedblad et al. 2002), (Johansson and Sundquist 1999, Flegal, Kit et al. 2013) and the similar pattern of relations were observed in the earlier

studies, (Manderbacka, Lundberg et al. 1999), (Ferraro and Yu 1995), (Lantz, House et al. 1998), (Faresjö and Rahmqvist 2010), (Khanna, Maranian et al. 2011). This probably reflects that a woman has lower socio-economic status in the society than men and the strong relationships of education with incomes. Those who attained better educational status may have more opportunity to have better annual household income or much more ability to manage incomes than the counterparts.

Those who did intensive exercise for 3 or more hours had reduced risk of reporting poor self-reported health as compared to those who had no such activity, while light physical activity as compared with hard physical activity showed slightly less significant correlations relatively. Despite, one of the main changes in health behaviors the last years has been a decrease in physical activity both at work and at leisure, and the rise in overweight and obesity is often connected to this problem' (Anderssen, Engeland et al. 2008). One recent study found that obese participants had lower overall physical activity compared to normal weight participants, (Hansen, Holme et al. 2013). Physical activity can also be associated with self-reported health, irrespective of an increased BMI. We found that both light and hard physical activity decreased the risk of poor health. (Hansen, Holme et al. 2013). A similar finding is reported previously, where daily walking was found to be inversely related to mortality among elderly people, (Samawi 2013).

There was however a small effect for those with a moderate alcohol intake, (Petrie, Doran et al. 2008). On the other hand, previous studies examining the association with moderate intake of alcohol and diseases, found that a moderate intake of alcohol, including red wine, reduced the risk of cardiovascular, cerebrovascular, and peripheral vascular diseases in populations, (Szmitko and Verma 2005), and one recent study confirms these results, showing that a moderate alcohol consumption was associated with lower risk of stroke in a population of women, (Jimenez, Chiuve et al. 2012). Furthermore, our result showing that smoking is associated with poor health is supporting previous studies regarding self-reported health, (Goldman, Gleib et al. 2004) as well health-related quality of life, (Strine, Chapman et al. 2008).

This study has both limitations and strengths. The data from 1997-1999 (HUSK) health study was based on a large sample size of a general population in Norway. The data was collected in 1997-99, and although the levels of the variables may have changed from this time, we do not believe that these time gaps have had a significant impact on the associations reported in the current study findings. Also the variables that we used in the current study

were self-reported, and such subjective data sometimes may give even more accurate information than the more objective measures. However, there might be recall bias and socially undesirable behaviors under-reported during data collection. We have also found that our results correspond well with several previous studies which were carried out based on recently collected data.

6. Conclusion

In general, Self-reported health was positively associated with lifestyle factors such as, Leisure time exercise, individuals who consume moderate amount of alcohol/wine/ and attained better educational background and being gender men. On the other hand, Health-related behaviors and risk factors, such as overweight or obesity, and those who consume high amount of alcohol/spirits/ and being current smokers perceived their health status negatively. In addition, confounders such as, socio-demographic (gender women, individuals who are not in marital union, as well as chronic illness were associated with poor self-reported general health status in the middle age Norwegian population. In general, certain crucial lifestyle and risk factor such as being overweight or obese, consuming high alcohol /spirits/, and being current smokers and being not in marital union, women gender, chronic health problems and less attainment of educational status were found determinant factors to predict poor self-reported health in middle aged Norwegian populations. Therefore, Future health policy, strategies and interventions should consider and target health-related behaviors such as, high alcohol intake, chronic diseases, women, and physical active and cigarette smokers to reduce the risk of poor self-reported health in the Norwegian society.

In conclusion, a wide range of factors are included into the concept of health when individuals are reporting how they evaluate their current health. The one-item question may be suitable for health care providers or nurses to use as an instrument to identify how patients or clients of health care services evaluate their subjective health.

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Table 1. Characteristics of the participants (N=12883)

Variables	Percent
Self-rated health	
Very good/good	87.0
Not so good/poor	13.0
Gender	
Male	48.6
Women	51.4
Marital status	
Married	74.6
Other	25.4
Education*	
Low	17.0
Medium	45.8
High	37.2
Disease (having any of the listed diseases)**	
No	90.2
Yes	9.8
Body mass index	
<18.5	0.8
18.5-24.9	49.5
25-29.9	38.8
30-34.9	9.1
35+	2.4
Wine (units per two weeks)	
None	50.7
1-14	48.3
15+	1.0
Beer (units per two weeks)	
None	54.2
1-14	43.6
15+	2.2
Spirits (units per two weeks)	
None	79.1
1-14	20.8
15+	0.2
Light physical activity (hours per week)	
None	4.3
<1	14.6
1-2	38.1
3+	43.0
Hard physical activity (hours per week)	
None	29.7
<1	28.8
1-2	28.4
3+	13.1
Smoking	
Never smoker	37.6
Former smoker	28.0
Current smoker	34.4

Table 2. Odds ratios for having not so good or poor self-rated health (N=12883)

Variables	Unadjusted			Adjusted		
	OR	95%CI	P-value	OR	95%CI	P-value
Gender						
Male (ref)	1			1		
Women	1.4	1.2, 1.5	<0.001	1.3	1.2, 1.5	<0.001
Marital status						
Married (ref)	1			1		
Other	1.5	1.4, 1.8	<0.001	1.5	1.4, 1.7	<0.001
Education						
Low (ref)	1			1		
Medium	0.6	0.5, 0.7	<0.001	0.7	0.6, 0.8	<0.001
High	0.4	0.4, 0.5	<0.001	0.6	0.5, 0.7	<0.001
Disease						
No (ref)	1			1		
1+	2.9	2.5, 3.3	<0.001	2.7	2.3, 3.1	<0.001
Body mass index						
<18.5	1.5	0.9, 2.5	0.149	1.2	0.7, 2.0	0.556
18.5-24.9 (ref)	1			1		
25-29.9	1.1	0.9, 1.1	0.422	1.1	1.0, 1.3	0.089
30-34.9	1.9	1.6, 2.1	<0.001	1.6	1.3, 1.9	<0.001
35+	2.3	1.8, 3.1	<0.001	1.7	1.3, 2.3	<0.001
Wine (units per two weeks)						
None (ref)	1			1		
1-14	0.5	0.5, 0.6	<0.001	0.7	0.6, 0.8	<0.001
15+	0.6	0.5, 1.1	0.113	0.8	0.4, 1.4	0.421
Beer (units per two weeks)						
None (ref)	1			1		
1-14	0.6	0.6, 0.7	<0.001	0.8	0.7, 0.9	0.001
15+	1.1	0.8, 1.5	0.604	1.1	0.8, 1.5	0.642
Spirits (units per two weeks)						
None (ref)	1			1		
1-14	0.8	0.7, 0.9	<0.001	1.0	0.9, 1.2	0.916
15+	4.9	2.2, 11.3	<0.001	3.3	1.4, 7.9	<0.001
Light physical activity (hours per week)						
None (ref)	1			1		
<1	0.8	0.6, 1.0	0.030	0.9	0.7, 1.2	0.576
1-2	0.5	0.4, 0.6	<0.001	0.7	0.6, 0.9	0.008
3+	0.5	0.4, 0.6	<0.001	0.7	0.6, 0.9	0.010
Hard physical activity (hours per week)						
None (ref)	1			1		
<1	0.6	0.5, 0.7	<0.001	0.8	0.7, 0.9	<0.001
1-2	0.5	0.4, 0.5	<0.001	0.7	0.6, 0.8	<0.001
3+	0.4	0.3, 0.5	<0.001	0.5	0.4, 0.7	<0.001
Smoking						
Never smoker (ref)	1			1		
Former smoker	0.9	0.8, 1.0	0.030	0.9	0.8, 1.0	0.052
Current smoker	1.4	1.2, 1.6	<0.001	1.2	1.1, 1.4	<0.001

Note: *: "Low" completed (up to and including 10 years of schooling), "Medium" completed high schooling and "High" completed (college/University) studying. **: (Heart infarct, Apoplexies and Diabetes)

Appendix 1

The Article: Lifestyle Factors and Self-reported General Health: The Hordaland Health Study

To be submitted to International Journal of Nursing Practice

TITLE PAGE

Lifestyle Factors and Self-reported General Health:

The Hordaland Health Study

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ABSTRACT

Information on self-reported health is important for health professionals, and the aim of this study was to examine how lifestyle factors such as smoking, alcohol consumption, physical activity and body mass index (BMI) were associated with self-reported health in a sample of 12.883 individuals from the Norwegian population. Self reported health was measured with a one-item question and the analyses were adjusted for sociodemographic and disease variables. Odds ratios for having not so good or poor health were calculated in multiple logistic regression analyses. We found that respondents reporting adverse lifestyle behaviors (BMI >30, smoking or excessive intake of alcohol) showed an increased risk of poor health. Furthermore, having a moderate intake of wine or being physically active, decreased the risk of poor health. In conclusion, a one-item question measuring self-reported health may be a suitable measure for nurses to use in a practical setting, to identify levels of subjective health among the patients or other recipients of our health services.

Key words: Self-reported health, smoking, alcohol consumption, BMI, physical activity

INTRODUCTION

Current health problems are complex and often related to a person's lifestyle, and thus it is necessary to examine them with self-reported data. These kinds of data can be an important complement to more objective data based on the assessment made by health professionals, as reported by Idler and Benyamini¹ in a review of 27 community studies. This review found that self-reported health was a predictor of mortality in nearly all of the studies and this connection may be seen as well established¹. The question of how people may understand and interpret the concept of self-reported health is still unanswered. Jyllha² has proposed a conceptual model to help identifying the different types of information on which people base their health assessments. In this model, the evaluation of one's own health encompasses a review of information, such as functional status, diseases, health behaviors and sociodemographic factors. Additionally the model consists of factors comprising contextual frameworks, such as cultural aspects².

Lifestyle factors are among the kind of behaviors that individuals consider when they report their own general health², and previous research have found that cigarette smoking and alcohol consumption were related to reduced physical and mental health³. In addition, obesity has been found as a predictor of self-rated health⁴. The experience of general health have also been found to differ according to levels of education^{5, 6} and age⁷. One previous study have examined if different risk factors contributed to self-reported health, where the effect of various health problems was also included⁸. In this study, the authors examined the relationship between risk factors such as dietary habits, exercise, smoking, alcohol consumption and body mass index, and self-reported health. They found that these associations were weakened or not significant at all when they were adjusted for health problems⁸.

In the present study we examine lifestyle factors (smoking, alcohol consumption, leisure time exercise and body mass index) as risk factors for self-reported general health in an adult Norwegian population, with adjustment for sociodemographic characteristics (age, gender, marital status and education) and diseases (heart disease, apoplexia and diabetes).

METHODS

Sample and selection

The Hordaland Health Study (HUSK) was conducted during 1997-99 as a collaboration between the National Health Screening Service, the University of Bergen and local health services. The study population included all individuals in Hordaland county born 1953-57 (29.400). A total of 8.598 men and 9.983 women participated, yielding a participation rate of 52 % for men and 70 % for women. Complete information for all variables included in the present study was available for 12.883 individuals (44 % of the study population).

The study protocol was approved by the Regional Ethics Committee and by the Norwegian Data Inspectorate.

Measurements

Information on self-rated health, socio-demographic variables, disease, and lifestyle factors were obtained from a self-administered questionnaire. Self-rated health was measured by one question: "How is your overall health at the moment?", with four response categories: "poor", "not so good", "good" and "very good". This measure has previously been validated and shown good reliability⁹. The responses were dichotomized into "very good/good" and "not so good/poor".

Marital status were dichotomized into "married" (including living with a partner) or "other". Education was used as an indicator of socioeconomic status. Five categories for educational level were coded as "low" (up to and including 10 years of schooling), "medium"

(high school), and “high” (college/university). Having or not having a disease were coded from self-reported occurrence of heart attack, cerebral stroke, brain hemorrhage, angina pectoris, and/or diabetes.

The measures of lifestyle were leisure time physical activity, tobacco smoking, and alcohol consumption. Physical activity was assessed by two questions about the average weekly number of hours of either light (not sweaty or short of breath) or hard leisure time physical activity the last year. The categories are “none”, “less than 1 hour”, “1-2 hours”, or “3 hours or more” for both questions. These questions have demonstrated small to moderate correlations with a $\dot{V}O_2$ max measurement through a exercise test on a treadmill¹⁰. Data on tobacco smoking were coded into three categories; “never a smoker”, “formerly a smoker”, or “currently a smoker”. The questions used for assessing smoking has shown predictive validity for the risk of coronary heart disease morbidity¹¹. Units of alcohol per two weeks were categorized as “none”, “1-14”, or “15 or more” for beer, wine, and spirits, respectively. 15 units/two weeks have previously been used as a cut-off point for high alcohol consumption¹². The questions used for assessing alcohol consumption in this study have shown predictive validity for the risk of non-response in a population-based health study¹³.

Height and weight were measured at a physical examination, and BMI was calculated as kilograms per square meter and divided in accordance with the World Health Organization classification of underweight ($<18.5 \text{ kg/m}^2$), normal weight (18.5-24.9), overweight (25-29.9), obesity grade I (30-34.9) and obesity grade II and more (35+)¹⁴.

Statistical analyses

Descriptive statistics were used to present the sample. Univariate and multivariate logistic regression were applied to study associations between lifestyle factors (consumption of beer, wine and spirits, light- and strenuous physical activity and smoking) and self-rated health.

Gender, marital status, education, diseases and BMI were included as covariates. Age was not included in the analysis as it had very small variability, and preliminary analysis showed that it did not influence the results (data not shown). A p-value <0.05 indicated statistical significance. The statistical package IBM SPSS for windows, version 20.0, was used in the analysis.

RESULTS

Study sample

All study participants (12.883) were aged 40-44 years. Among these, 51.4 % were women (Table 1). The frequencies of the life style factors are also shown in this table, and 49.5 % reported a body mass index of 18.5-24.9. A smaller proportion (11.5 %) reported a body mass index of 30 or more. The consumption of wine (1-14 units per two weeks) was reported by 48.3 % of the participants, the consumption of beer (1-14 units per two weeks) by 43.6 %, and the consumption of spirits (1-14 units per week) by 20.8 % (Table 1). As seen in this table, 43.0 % reported doing light physical activity and 13.1 % hard physical activity three hours or more per week. Furthermore, 34.4 % of the participants were current smokers (Table 1).

Lifestyle factors and self-rated health

As seen in Table 1, 87 % of the participants rated their health as very good or good, and 13 % as not so good or poor. In Table 2, the odds of rating their health as not so good or bad are shown. Among the lifestyle-related variables, a body mass index of 30 or more was significantly related to an increased risk of not so good or bad health (Table 2). Being current smoker was also significantly related to an increased risk of not so good or poor health. In addition, the consumption of 15 or more units of spirit per two weeks was significantly related to adverse health. On the other hand, a moderate intake of wine or beer (1-14 units per two weeks) decreased the risk of adverse health. Furthermore, both light and hard physical activity decreased the risk of not so good or bad self-reported health (Table 2).

The associations between lifestyle factors, sociodemographic variables, and general health were similar whether the disease variable was included into the statistical model or not (results not shown). Hence, we did not find a mediating effect of the disease variable.

DISCUSSION

In this study we found that the participants rated their odds of having poor health if they reported their body mass index of 30 or more, were current smokers or were drinking 15 or more units of spirit per two weeks. On the other hand, having a moderate intake of wine or beer or being physically active, decreased the risk of adverse health. These results are adjusted for sociodemographic and disease variables.

Self-reported health, as measured by a one-item question, has previously been well established as a predictor of mortality¹ and a recent study also found that self-reported health was a predictor of lung cancer¹⁵. The question of what kind of information each individual base their evaluation on when answering this question, is previously discussed and encompasses a wide range of factors of both individual and social character². Among these factors are lifestyle behaviors.

Overweight and obesity have a broad spectrum of explanation factors, and can also be seen as lifestyle-related health problems. Furthermore, it is a rising public health and clinical problem¹⁶ and data from the Norwegian Population show that the levels of body weight have increased during the last decades¹⁷. The prevalence of overweight among children and adolescents is also high¹⁸. As in the present study, Prosper and colleagues found that high levels of BMI were predictors of self-reported health⁴. Similar findings are reported with health-related quality of life¹⁹. Previous research has also shown that high levels of BMI are associated with cardiovascular risk²⁰ and mortality²¹.

One of the main changes in health behaviors the last years has been a decrease in physical activity both at work and at leisure, and the rise in overweight and obesity is often

connected to this problem²². One recent study found that obese participants had lower overall physical activity compared to normal weight participants²³. Physical activity can also be associated with self-reported health, irrespective of an increased BMI. We found that both light and hard physical activity decreased the risk of poor health. A similar finding is reported previously, where daily walking was found to be inversely related to mortality among elderly people²⁴.

We found that the consumption of 15 or more units of spirits per two weeks increased the risk of poor self-reported health, and this result is in accordance with previous research on binge drinking²⁵. The results regarding a decreased risk of poor health for a moderate intake of wine or beer, are more inconsistent. In examining the association with harmful patterns of alcohol consumption and self-reported health status measured by EQ5D, Petrie and colleagues²⁶ found that all levels of risky alcohol use, including the low risk level, were associated with lower self-reported health. There was however a small effect for those with a moderate alcohol intake²⁶. On the other hand, previous studies examining the association with moderate intake of alcohol and diseases, found that a moderate intake of alcohol, including red wine, reduced the risk of cardiovascular, cerebrovascular, and peripheral vascular diseases in populations²⁷, and one recent study confirms these results, showing that a moderate alcohol consumption was associated with lower risk of stroke in a population of women²⁸. Furthermore, our result showing that smoking is associated with poor health, is supporting previous studies regarding self-reported health²⁹ as well as health-related quality of life³⁰.

The data material from HUSK is based on a large sample of a general population in one of the counties of Norway. The data gathering was performed in 1997-99, and although the levels of the variables may have changed from this time, we do not believe that these changes have had a significant impact on the associations reported in the study. We have also found that our results correspond well with previous studies based on newer data.

In conclusion, a wide range of factors are included into the concept of health when individuals are reporting how they evaluate their current health. The one-item question may be suitable for nurses to use as an instrument to identify how patients or other recipients of health services evaluate their subjective health.

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Table 1. Characteristics of the participants (N=12883)

Variables	Percent
Self-rated health	
Very good/good	87.0
Not so good/poor	13.0
Gender	
Male	48.6
Women	51.4
Marital status	
Married	74.6
Other	25.4
Education	
Low	17.0
Medium	45.8
High	37.2
Disease (having any of the listed diseases)	
No	90.2
Yes	9.8
Body mass index	
<18.5	0.8
18.5-24.9	49.5
25-29.9	38.8
30-34.9	9.1
35+	2.4
Wine (units per two weeks)	
None	50.7
1-14	48.3
15+	1.0
Beer (units per two weeks)	
None	54.2
1-14	43.6
15+	2.2
Spirits (units per two weeks)	
None	79.1
1-14	20.8
15+	0.2
Light physical activity (hours per week)	
None	4.3
<1	14.6
1-2	38.1
3+	43.0
Hard physical activity (hours per week)	
None	29.7
<1	28.8
1-2	28.4
3+	13.1
Smoking	
Never smoker	37.6
Former smoker	28.0
Current smoker	34.4

Table 2. Odds ratios for having not so good or poor self-rated health (N=12883)

Variables	Unadjusted			Adjusted		
	OR	95%CI	P-value	OR	95%CI	P-value
Gender						
Male (ref)	1			1		
Women	1.4	1.2, 1.5	<0.001	1.3	1.2, 1.5	<0.001
Marital status						
Married (ref)	1			1		
Other	1.5	1.4, 1.8	<0.001	1.5	1.4, 1.7	<0.001
Education						
Low (ref)	1			1		
Medium	0.6	0.5, 0.7	<0.001	0.7	0.6, 0.8	<0.001
High	0.4	0.4, 0.5	<0.001	0.6	0.5, 0.7	<0.001
Disease						
No (ref)	1			1		
1+	2.9	2.5, 3.3	<0.001	2.7	2.3, 3.1	<0.001
Body mass index						
<18.5	1.5	0.9, 2.5	0.149	1.2	0.7, 2.0	0.556
18.5-24.9 (ref)	1			1		
25-29.9	1.1	0.9, 1.1	0.422	1.1	1.0, 1.3	0.089
30-34.9	1.9	1.6, 2.1	<0.001	1.6	1.3, 1.9	<0.001
35+	2.3	1.8, 3.1	<0.001	1.7	1.3, 2.3	<0.001
Wine (units per two weeks)						
None (ref)	1			1		
1-14	0.5	0.5, 0.6	<0.001	0.7	0.6, 0.8	<0.001
15+	0.6	0.5, 1.1	0.113	0.8	0.4, 1.4	0.421
Beer (units per two weeks)						
None (ref)	1			1		
1-14	0.6	0.6, 0.7	<0.001	0.8	0.7, 0.9	0.001
15+	1.1	0.8, 1.5	0.604	1.1	0.8, 1.5	0.642
Spirits (units per two weeks)						
None (ref)	1			1		
1-14	0.8	0.7, 0.9	<0.001	1.0	0.9, 1.2	0.916
15+	4.9	2.2, 11.3	<0.001	3.3	1.4, 7.9	<0.001
Light physical activity (hours per week)						
None (ref)	1			1		
<1	0.8	0.6, 1.0	0.030	0.9	0.7, 1.2	0.576
1-2	0.5	0.4, 0.6	<0.001	0.7	0.6, 0.9	0.008
3+	0.5	0.4, 0.6	<0.001	0.7	0.6, 0.9	0.010
Hard physical activity (hours per week)						
None (ref)	1			1		
<1	0.6	0.5, 0.7	<0.001	0.8	0.7, 0.9	<0.001
1-2	0.5	0.4, 0.5	<0.001	0.7	0.6, 0.8	<0.001
3+	0.4	0.3, 0.5	<0.001	0.5	0.4, 0.7	<0.001
Smoking						
Never smoker (ref)	1			1		
Former smoker	0.9	0.8, 1.0	0.030	0.9	0.8, 1.0	0.052
Current smoker	1.4	1.2, 1.6	<0.001	1.2	1.1, 1.4	<0.001

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Books

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Norsk: En studie av sammenhengen mellom helsevaner og selvrapportert generell helse

Engelsk: A study of the relationship between lifestyle factors and self-reported general health

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5. PROSJEKTBESKRIVELSE (vennligst legg ved komplett beskrivelse)	
A) Formål og problemstillinger (maks. 1500 tegn)	<p>The aims of the study are:</p> <ul style="list-style-type: none"> • To examine whether there are associations between lifestyle factors such as smoking, alcohol consumption, leisure time exercise and body mass index and self-reported general health among adult Norwegian populations. • To examine whether these association are mediated by disease and socio-demographic characteristics
B) Kort sammendrag (maks. 4000 tegn)	<p>Back ground</p> <p>This study is going to examine the association between lifestyle factors and health behaviors such as leisure time exercise, alcohol consumption, smoking and body mass index, and self-reported general health among the adult Norwegian population. The data come from the Hordaland Health study 1997-1999 (HUSK). HUSK was conducted as collaboration between the National Health screening services, the University of Bergen and local health services.</p> <p>Overall Objective</p> <p>To examine whether Lifestyle factors predict self-reported general health status in an adult Norwegian population.</p> <p>Methods</p> <p>The study has a quantitative, cross-sectional design using anonymous data from the HUSK study. The data was collected 1997-1999 in Hordaland Country, Norway. In the current study we want to use data about the independent variables of Lifestyle, such as leisure time exercise, alcohol consumption, smoking, Dietary habits and BMI, the dependent variable self-reported general health and Confounding variables in the form of illness and socio-demographic characteristics. The data analysis will be carried out using descriptive statistics and logistic regression analysis. All data analysis will be performed by SPSS. The HUSK study protocol was approved by the Regional Ethical committee and all participants gave their written consent. An application will be sent to the regional Ethical committee for approval of the current project.</p> <p>Publication</p> <p>The study is a part of a Master thesis and will be performed from June 2012-June 2013. An article will be published in an international peer-reviewed journal and</p>

	the thesis will be submitted in the spring semester 2013.
C) Planlagte artikler	Lifestyle factors as predictors for self-reported general health: The Hordaland Health Study
D) Nøkkelord (3-8 beskrivende nøkkelord)	
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II. SØKNAD OM DATA

8. DATAKILDER	
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B) Andre datakilder:	Skal data eller biologisk materiale fra andre kilder enn Folkehelseinstituttets datakilder brukes, eventuelt egne data? <input type="checkbox"/> Ja, spesifiser: x Nei
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F) Uavhengige variabler (hovedeksponering):	Beskriv variablene: Punkt 5. Spørsmål om mosjon Punkt 6. Spørsmål om kaffe/te/alkohol Punkt 7. Spørsmål om røyking Punkt 8. Spørsmål om endring av helsevaner
G) Andre uavhengige variabler: (Confoundere eller kovariater)	Beskriv variablene: Sosiodemografiske variabler (alder, kjønn, sivil status, utdanning) Andre bakgrunnsvariabler (høyde, vekt) Punkt 1. Sykdomsvariabler

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9. VURDERING/GODKJENNING AV ANDRE INSTANSER*

A) Krever prosjektet godkjenning fra REK?	<input type="checkbox"/> Ja, en kopi av søknaden og (REKs) godkjenning er vedlagt <input checked="" type="checkbox"/> Ja, en kopi av søknaden og (REKs) godkjenning vil bli ettersendt <input type="checkbox"/> Nei, prosjektet er ikke framleggingspliktig
B) Krever prosjektet endringsmelding til REK?	<input type="checkbox"/> Ja, en kopi av søknaden og (REKs) godkjenning er vedlagt <input type="checkbox"/> Ja, en kopi av søknaden og (REKs) godkjenning vil bli ettersendt <input type="checkbox"/> Nei, prosjektet trenger ikke slik godkjenning
C) Krever prosjektet disp. fra taushetsplikt for tilgang til taushetsbelagte data fra andre instanser? (eks. Kunnskapsdep., Justis- og politidep., Arbeids- og inkluderingsdep., NAV)	<input type="checkbox"/> Ja, vennligst angi hvem, og legg ved kopi av søknad(-er) og dispensasjon(-er) <input type="checkbox"/> Ja, kopi av søknad(-er) og dispensasjon(-er) vil bli ettersendt <input checked="" type="checkbox"/> Nei, prosjektet trenger ikke dispensasjon
D) Er det nødvendig med tillatelser fra andre data-eiere? (eks. Kreftregisteret, NPR, SSB)	<input type="checkbox"/> Ja (vennligst angi hvem, og legg ved kopi av tillatelse) <input checked="" type="checkbox"/> Nei
F) Eventuelle kommentarer til tillatelser:	

10. SØKNADSDATO OG VEDLEGG

Søknadsdato	
Vennligst legg ved følgende vedlegg	<ol style="list-style-type: none"> 1. Komplette forskningsprotokoll, inkludert en publiseringsplan 2. Prosjektleders CV 3. Liste som inkluderer spørreskjema som det søkes om. 4. Evt. annet

Permission to use the HUSK-study data



Helseundersøkelsen i Hordaland 1997 - '99

Vår ref.: KJ-2012-08-23

Bergen, torsdag 23. august 2012

Gerd Karin Natvig

The Study Proposal of the relationship between Lifestyle Factors and self-reported general health, In Hordaland Health Study, Norway

The Hordaland Health Study '97-'99 (HUSK) steering committee has received the project description **“The Study Proposal of the relationship between Lifestyle Factors and self-reported general health, In Hordaland Health Study, Norway”**

HUSK steering committee gives Tadesse W. Dogisso (MSc student), and supervisors Gerd Karin Natvig Professor, Randi Jepsen, PhD student and John Roger Andersen, PhD permissions to use specific HUSK variables for this project. For all publications, the Vancouver Convention for Uniform Requirements for Manuscripts Submitted to Biomedical Journals shall be followed.

The purpose of this agreement is to permit linkage of the variables listed in the project description.

Sincerely,

Grethe S. Tell, Professor, HUSK Principal Investigator
Bergen, ____/____-2012

I, the undersigned, confirm that the project files from the Hordaland study, used in the project: **“The Study Proposal of the relationship between Lifestyle Factors and self-reported general health, In Hordaland Health Study, Norway”**

will be kept unavailable and that they will not be sent to people not involved in the project.

The data will only be used for the project specified in the approved application to the steering committee. The file, including all copies, will be deleted after the completion of the project (within 3 years), or a new application will be submitted.

Sincerely,

Gerd Karin Natvig
Professor, supervisor

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Kalfarveien 31	55 58 85 27 (Kari Juul)	55 58 85 36
5018 BERGEN	55 58 85 22 (Grethe S. Tell)	

e-post: kari.juul@isf.uib.no eller Grethe.Tell@isf.uib.no